174

Number 174 • July 18, 1989

Advance Data

From Vital and Health Statistics of the National Center for Health Statistics

Use of Vitamin and Mineral Supplements in the United States: Current Users, Types of Products, and Nutrients

by Abigail J. Moss, Division of Health Interview Statistics, National Center for Health Statistics, and Alan S. Levy, PhD., Insun Kim, Dr. P.H., and Youngmee K. Park, PhD., Food and Drug Administration

Introduction

There is general agreement among health professionals that a balanced diet provides most persons with those nutrients essential for good health (1). Exceptions include individuals with certain specified diseases and those with special dietary needs, such as infants and pregnant or lactating women (2,3). The use of vitamin and mineral products to supplement the diet, however, continues to be an everyday practice for millions of Americans.

The first National Health and Nutrition Examination Survey conducted between 1971 and 1974 showed that about 23 percent of U.S. adults took supplements daily (4). More recently, estimates from the National Telephone Interview Special Dietary Foods Study conducted by the U.S. Food and Drug Administration's Division of Consumer Studies, Center for Food Safety and Applied Nutrition, indicated that in 1980, excluding pregnant and lactating females who have special supplementation needs, about 4 in 10 adults regularly used one vitamin and mineral product or more (5).

In 1986, the National Center for Health Statistics (NCHS), in collaboration with the U.S. Food and Drug Administration (FDA) and as part of its National Health Interview Survey (NHIS), collected information to produce measures of vitamin and mineral supplement users and the composition and quantities of specific nutrients consumed.

Because the use and composition of vitamin and mineral products fluctuate, one objective of the NCHS study was to update the 1980 FDA estimates and to make it possible to identify trends. In addition, an attempt was made to overcome several limitations of the earlier FDA survey. The FDA survey, for example, did not include young children; and the survey's sample size placed some constraints on the types of analyses that could be undertaken, including deriving nutrient intake level estimates for certain small population domains. NHIS' larger and more representative sample was expected to permit more focused analyses on specific population subgroups than were previously possible.

A second objective for the NCHS survey was to provide relevant estimates that would address a priority objective stated in the Public Health Service (PHS) plans for attaining the 1990 Objectives for the Nation (6). The specific objective addressed was to develop nutrition status monitoring systems that would have the ability to detect nutritional problems in special population groups, as well as to obtain data for decisions about national nutrition policies.

This report presents estimates from the NCHS survey of the percent of adults and young children 2 to 6 years of age residing in the United States who used nonprescription vitamin and mineral supplement products in 1986. These estimates are shown by age, race, and sex, and by age with Hispanic origin, family income, poverty status, education, marital status, geographic region, place of residence, respondent-assessed health status, and weight status. Percent estimates for these variables are shown in tables 1 and 2.

The report also presents estimates of the percent of persons using types of products and nutrients, and the number of individual products taken. Tables 3, 4, and 5 contain these estimates. Vitamin and mineral product

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control

National Center for Health Statistics
Manning Feinleib, M.D., Dr. P.H., Director

HE 20.6209/3:

READEX FICHE best copy available

estimates are presented in table 6 by the frequency with which they were taken. In tables 7 and 8, the median, 90th, and 95th percentile levels of intake are given for specific nutrients, expressed as a percent of the Recommended Dietary Allowance (RDA) or as a percent of the midrange levels of "Estimated Safe and Adequate Daily Dietary Intakes" (ESADDI) as applicable, and as established by the Food and Nutrition Board (7). Most of the estimates in tables 3 to 8 are shown by age and sex as well. Tables 9 and 10 contain population estimates needed to derive estimated frequencies for the percent estimates presented in tables 1 to 6.

Description of data

The data presented in this report are based on information obtained from NCHS' 1986 National Health Interview Survey. For each family interviewed during January and into July of that year, one adult 18 years of age or older and one child from 2 to 6 years of age were randomly selected to receive the vitamin and mineral questionnaire. All estimates shown are based upon these sample person counts and, except for tables 7 and 8, are weighted to produce national estimates.

The questionnaire items used to derive the estimates shown in this report identified which sample persons took any vitamin, mineral, or fluoride products during the 2-week period preceding the interview and the number of different products taken. Sample persons reporting any use were then asked to get the vitamin and mineral product containers so that the name of the product, the manufacturer's name, and the exact nutrient components and units information could be obtained directly from the labels. Where no container was available, persons were asked to report the name and manufacturer of the product(s) taken.

Other questionnaire items obtained information about the frequency and length of time each vitamin and mineral product was taken and whether it was obtained through a doctor's prescription. In addition, women of childbearing age were asked whether they were pregnant or breastfeeding a baby during the preceding 2 weeks.

A facsimile of these questionnaire items is provided in *Current Estimates From the National Health Interview Survey, 1986* (8).

The technical notes section of this report contains a brief description of sample size, response rates, terms used, and data collection procedures employed.

Results

Profile of vitamin and mineral supplement users

For this report, a vitamin and mineral supplement user is anyone who took at least one nonprescription vitamin, mineral, or fluoride product during a 2-week reference period before the interview. It should be noted here, however, that pregnant and lactating sample persons are excluded from the estimates derived for this report. Persons taking *only* prescription vitamin and mineral products (409 sample persons, or 3 percent of the total sample) are not classified as supplement users because the intended purpose of this report is to provide estimates that describe the self-prescribed supplement user population.

During 1986, more than one-third of all U.S. adults (36 percent) took nonprescription vitamin and mineral supplements (table 1). The percent of adults under 25 years of age who used them was somewhat lower (28 percent) than for all other adults (38 percent). Women were more likely to consume these products (41 percent) than were men (31 percent). Differences in vitamin and mineral product usage between adult men and women were found in all but the youngest age groups (figure 1).

Young children were also major consumers of vitamin and mineral supplement products (43 percent). However, use was slightly lower among school age children, from about 47 percent among 3- and 4-year-olds to 40 percent among 5- and 6-year-olds. A difference was also found in the use of vitamin and mineral products among white and black young children. About 46 percent of white children and 30 percent of black children 2–6 years of age were reported to use vitamin and mineral supplements (table 2).

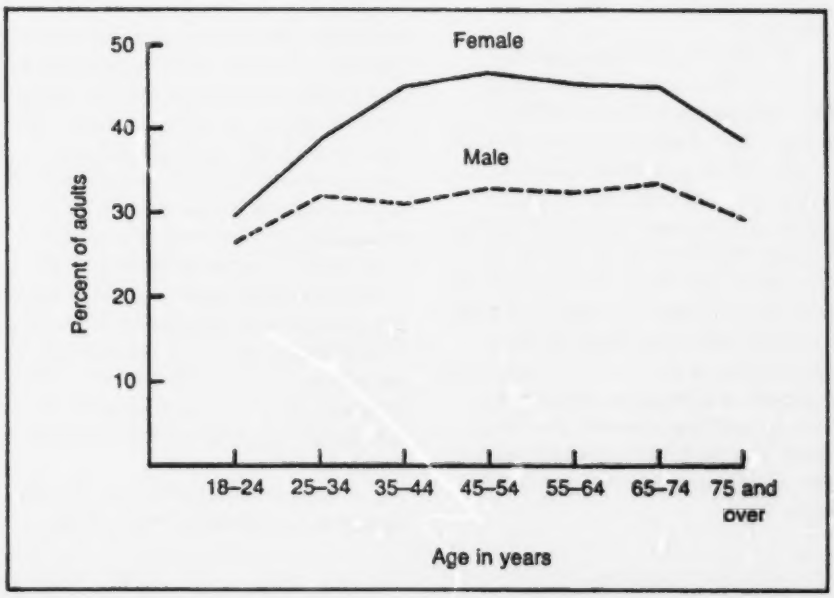

Figure 1. Percent of adults using vitamin and mineral products, by age and sex: United States, 1986

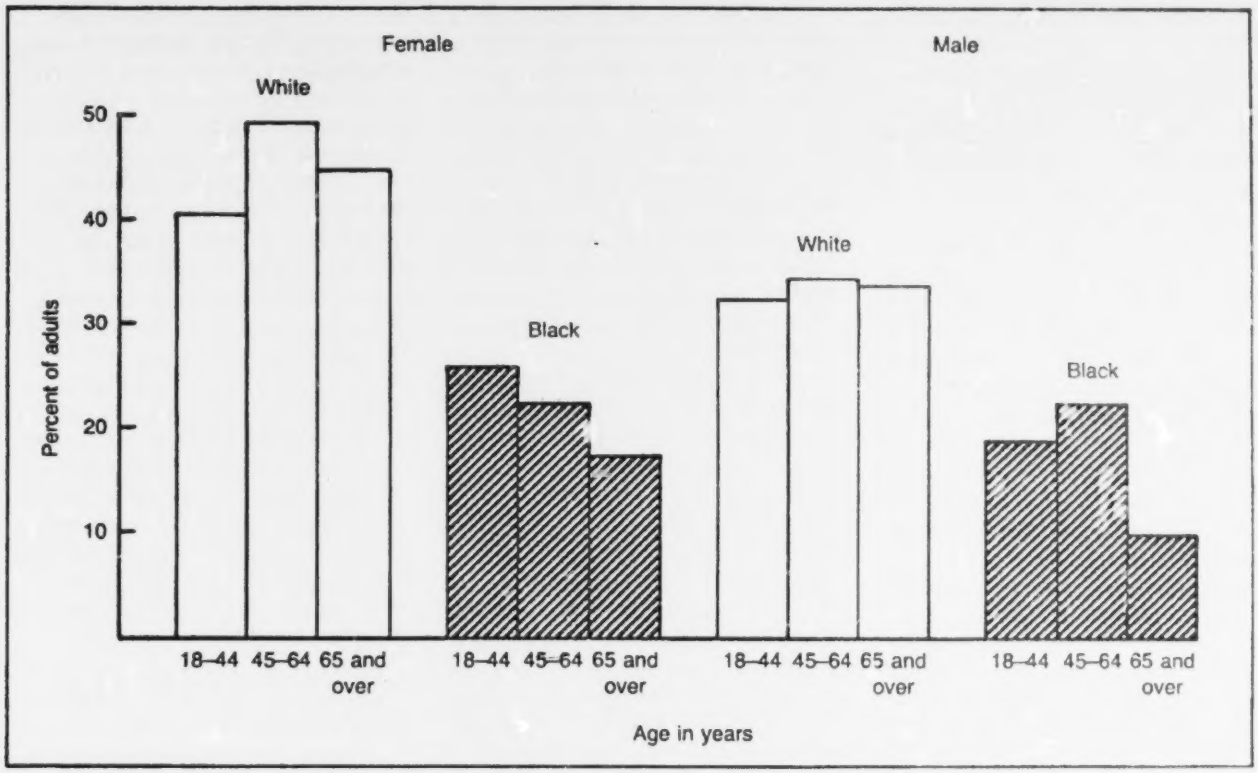

Figure 2. Percent of adults using vitamin and mineral products, by age, race, and sex: United States, 1986

Among adults, about two-fifths of all white persons in the United States used vitamin and mineral supplements compared with about one-fifth of all black adults. Differences in supplement usage between black and white persons were found for both sexes and among all age groups (figure 2). Within the population of Hispanic origin, about 29 percent of adults used nonprescription vitamin and mineral products. The greatest difference among racial groups was found among the elderly. Of persons aged 65 years and over, about 40 percent of white persons and persons of Hispanic origin and about 14 percent of black persons took vitamin and mineral supplements. Among elderly persons of all other races, over 50 percent reported their use.

As expected, family income and educational level are directly related to the use of vitamin and mineral products. Only about 28 percent of adults with family incomes under $7,000 compared with about 45 percent of persons with incomes at or above $40,000 reported their use. Differentials in usage by family income level were most pronounced for children. Specifically, only 23 percent of children aged 2 to 6 years in families earning under $7,000 took supplements compared with 50 percent of children in families earning $40,000 or more. Similarly, with increasing education, proportionately more persons took vitamin and mineral supplements. Among adults, the estimates ranged from about 25 percent of those not completing high school to 44 percent of those with 1 year of college or more. About 27 percent of young children were given vitamin and mineral supplement products in households where no related adult was a high school graduate, compared with over 50 percent of children in households where at least one related adult had some college education.

Differences in the percent of persons using vitamin and mineral supplements were also found by geographic area. Proportionately more persons in the West used vitamin and mineral products (45 percent) than in other regions of the country. Similarly, a higher proportion of persons living in metropolitan statistical areas (MSA's) reported using vitamin and mineral products than did those living outside these areas (38 percent compared with 31 percent).

Of the health status measures shown in this report, persons 18 years of age or older in "good health," that is, those who were not overweight and whose health was assessed as "good," "very good," or "excellent," were more likely to use vitamin and mineral supplements than less healthy persons. For example, 38 percent of persons whose assessed health was excellent or very good reported taking supplements compared with 31 percent of those in fair or poor health. About the same proportion of young children in fair or poor health, however, took vitamin and mineral supplements as did children whose health was rated as excellent or very good (about 45 percent).

Types of products and nutrients taken

Tables 3 and 4 present data on the kinds of products and nutrients taken. The first type of product classification shown in these and several other tables in this report contains nine distinct vitamin and mineral product categories according to a scheme developed by Stewart (5). For a description of the criteria for these categories, see the technical notes.

The second type of product classification separates products into two types, "broad-spectrum" and "specialized" products, using the scheme developed by Levy and Schucker (9). In this classification, broad-spectrum products are those that contain at least three of the following vitamins: A, B vitamins, C, D, and E. In addition, they may also contain one or more of the following minerals: calcium, phosphorus, iodine, iron, magnesium, copper, zinc, and manganese. All remaining products for this two-category classification are defined as specialized products.

The percents shown in table 3 are for all persons of specified ages in the U.S. population (except those excluded). Percents in table 4 are based on those persons who used at least one nonprescription vitamin and mineral product. For example, as shown in table 3, vitamin C was taken by about one third of all U.S. adults. Among adult vitamin and mineral supplement users, however, 85 percent took vitamin C (table 4). Both percent estimates are included in this report since each describes vitamin and mineral users in a meaningful way.

The following results refer to estimates for the U.S. population as shown in table 3. Single vitamins and vitamin and mineral combination products were the two most common types of products taken by U.S. women (each was taken by 17 percent of adult women). Among men, the two types of products consumed most often were single vitamins and multivitamins (13 percent for each type). About the same proportion of men and women reported taking multivitamins (13 percent and 15 percent, respectively).

Regardless of age, women were more likely than men to take single mineral products (10 percent compared with 4 percent). The difference in the percent of women and men taking single minerals was greatest for persons aged 45 to 64 years. Within this age group, 15 percent of women compared with 5 percent of men took at least one single mineral product, reflecting in part the greater usage of calcium products among older females.

Multivitamins were by far the most common type of vitamin and mineral product used by young children. In 1986, one-third of all U.S. children 2 to 6 years of age were taking multivitamins. However, unlike adults, few young children were given other types of vitamin and mineral products. For example, only 6 percent of children these ages took single vitamins.

In the second product classification, that is, broad-spectrum versus specialized products, the percent of women who took each type varied according to age. Younger women (under 45 years of age) were more likely to take broad-spectrum products (27 percent compared with the 22 percent who took specialized products). In contrast, women 45 years of age and over were more likely to take specialized products. Among those 45 to 64 years of age, 35 percent took specialized products and 26 percent took broad-spectrum products; for those 65 years old and over, 30 percent took specialized and 24 percent took broad-spectrum products.

Men under 45 years of age also were more likely to use broad-spectrum products than specialized products (21 percent compared with 15 percent). However, unlike older women, the proportion of men 45 years or older who used each type of product was about the same (20 percent for each).

Many more young children consumed broad-spectrum products (including multivitamin products) than consumed specialized products (38 percent compared with 8 percent).

What specific nutrients were in the products being consumed most often by adults and children in this country in 1986? More men and women (about 31 percent of adults) consumed vitamin C than any other nutrient. Calcium and iron led the list of minerals taken by women. About one-fourth of all women took calcium; the highest percent was among those women 45 to 64 years of age (29 percent). The percent of women in the United States who took iron ranged from about 21 to 25 percent, depending upon their age. Among men, iron was taken more than any other mineral (16 percent).

Because most children were given multivitamins, percent estimates were about the same for each of the specific vitamins listed except for pantothenic acid and biotin, which are not included in many multivitamins. The mineral taken most by young children was iron (about 18 percent).

Number of products taken and frequency of use

Table 5 contains percent estimates of vitamin and mineral supplement users by the number of individual products taken. For persons taking 1, 2, and 3 products or more, percents are also shown according to the type(s) of product(s) taken. The product type categories included in this table are the same as those shown in tables 3 and 4.

Among vitamin and mineral supplement users, most adults (60 percent) reported taking only one over-the-counter vitamin and mineral product (table 5). Similarly, among young children taking vitamin and mineral supplements, the vast majority, over 85 percent, used only one product.

The percent of adults who used two vitamin and mineral products or more was higher for persons 45 years of age or older (45 percent) than for those under 45 years of age (about 36 percent). Also, proportionately more women than men used more than one vitamin and mineral product (45 percent compared with 34 percent). About 5 percent of all adult users, which represents 3.1 million persons, reported using at least 5 vitamin and mineral products.

There were also differences in the types of vitamin and mineral products taken by persons who used only one product compared with persons who used more than one product. Whereas only 16 percent of adults who used one product took a single vitamin product, 86 percent of adults reporting 3 products or more reported taking a single vitamin product. Similarly, single mineral products were taken by only 6 percent of adults using one product compared with 49 percent of all adults taking 3 products or more. Among adults taking only one product, two-thirds of them took a broad-spectrum product.

About the same proportion of adults took multivitamin products, regardless of the total number of products taken (between 38 and 41 percent). Similarly, about the same proportion of young children given one product used a multivitamin as did children given two products (80 percent). Over 90 percent of all young children taking one product were given a broad-spectrum product.

Table 6 differs from other tables in this report in that the numbers and percents refer to the estimated number of vitamin amd mineral *products* reported, not the number of *persons* taking them. These data are shown by the frequency with which individual types of vitamin and mineral products were taken over a 2-week period. The time intervals shown are every day, from 2 to 6 days each week, and once a week or less.

Over 70 percent of all vitamin and mineral products used by adults and young children during 1986 were taken every day. The percent of products taken by adults on a daily basis did not vary appreciably among the different product categories.

About 75 percent of all multivitamins consumed by young children were taken every day. The percent of all other vitamin and mineral products taken by children on a daily basis, however, was somewhat lower (about 65 percent).

Intake levels of nutrients taken

Table 7 shows median, 90th, and 95th percentile average daily nutrient intake levels (most often represented as percents of the Recommended Dietary Allowances (RDA's)) for 12 vitamins and 7 minerals for men and women by three age groups. The RDA's are "the levels of intake of essential nutrients considered, in the judgment of the Committee on Dietary Allowances of the Food and Nutrition Board on the basis of available scientific knowledge, to be adequate to meet the known nutritional needs of practically all healthy persons" in the United States (7). For those nutrients for which no RDA values are established because of lack of information on which to base allowances, intakes are instead represented as percents of the midrange levels of Estimated Safe and Adequate Daily Dietary Intakes (ESADDI) as established by the Food and Nutrition Board. The nutrients reported as percents of the midrange ESADDI levels are pantothenic acid, biotin, and copper.

Table 8 is similar in content to table 7 except that the estimates are for young children. The individual nutrient estimates shown in both of these tables are based only on those persons taking the specific vitamin or mineral listed. Furthermore, they do not include persons who took *any* prescribed vitamin and mineral product or whose average daily intake for that nutrient is unknown. These exclusions may have had an effect on the estimates shown.

The estimates shown in tables 7 and 8 were obtained by first ordering numerically the RDA or ESADDI (unweighted) values for all eligible sample persons consuming a particular nutrient. The three RDA or ESADDI values (expressed in percents) that corresponded to the 50th, 90th, and 95th percentile positions in the listing were then selected.

Even if two individuals are adjacent by the order of their nutrient intake level, their intake levels still could differ by a relatively large amount. Such large differences would be more frequent at the extremes of intake level. Thus, the intake values shown in these two tables for the 90th and the 95th percentiles in particular are subject to considerable variability because of sampling.

Standard errors for these estimates are not available at this time because of the complexities involved in generating the figures. Therefore, data in tables 7 and 8 should be considered "provisional" and caution should be exercised in interpreting the findings. Nevertheless, the estimates for many of the nutrients are similar to results obtained from the 1980 FDA survey (5).

The median average daily intake for most of the vitamins listed in table 7 was between 100 and 200 percent of the RDA for both men and women. Among men, the vitamins with the highest median values were vitamin C (250 percent RDA) and vitamin B_{12} (300 percent RDA). Stated another way, the average amount of vitamin C consumed each day by 50 percent of all men reporting its use was no more than 2 1/2 times the RDA. For women, vitamin E and vitamin B_{12} had the highest median intake values (250 percent RDA for each), followed by thiamin (225 percent RDA) and riboflavin (217 percent RDA).

Data in table 7 show that some segment of the vitamin and mineral supplement user population took certain vitamins far in excess of the RDA. For 10 percent of adult male and female users, average daily intake for six vitamins—vitamins E, C, thiamin, riboflavin, vitamin B_6, and vitamin B_{12}—was greater than 15 times the RDA. Average daily intake of thiamin, riboflavin, vitamin B_6, and vitamin B_{12} was in excess of 30 times the RDA for 5 percent of these men and women. And 5 percent of women taking vitamin E ingested it at levels in excess of 35 times the RDA. Unfortunately, reasons for taking the vitamins were not determined for the NCHS survey.

All of the median intake values for the minerals listed were less than 200 percent of the RDA's or ESADDI's for both sexes. Although individual mineral intakes fell within a relatively close range, iron had the highest RDA value among 50, 90, and 95 percent of male and female users; it ranged from 1.8 to 5.4 times the RDA for men at these three

percentiles and from 2.8 to 4.5 times the RDA for women.

Among young children, the median intake level for most of the individual nutrients shown in table 8 also was between 100 and 200 percent of the RDA or ESADDI. At the 50th percentile, the highest intake level (286 percent) was for pantothenic acid. Five percent of children consumed about 4 times the RDA or ESADDI of vitamins A and E, folic acid, and pantothenic acid, and about 7.5 times the RDA of vitamin C.

It is generally recognized that most Americans meet their nutrient needs from foods alone, and that the use of supplements is therefore not necessary (10,11). Although there are no documented reports that daily vitamin and mineral supplement use at or below the RDA for a particular nutrient is either beneficial or harmful for the general population, the potentially adverse effects of large doses of certain nutrients are well documented (12).

The results presented are consistent with other studies showing that supplements are commonly used by the U.S. population and that intakes of some nutrients by individuals are well in excess of their RDA's. However, these data by themselves cannot be used to evaluate the need for or the safety of vitamin and mineral supplement use by the general population. These data do not include estimates of nutrient intakes from foods and drinking water; hence, total nutrient intakes cannot be estimated. Also, these data are limited to intakes during the 2 weeks prior to interview. In addition, the biochemical and clinical measures needed to document adverse physiological effects associated with high intakes of nutrients were not included in the survey.

Nationally representative survey data that quantify nutrient intakes from vitamin and mineral supplements are rare and have not been included in past food consumption and nutritional status surveys. Thus, the results from the 1986 NHIS make an important contribution in updating the knowledge of supplement use and in improving the ability to monitor the nutritional status of the U.S. population.

Table 1. Percent of persons using vitamin and mineral products, by sex and age: United States, 1986

Age	Both sexes	Female	Male
		Percent	
All adults 18 years and over	36.4	41.3	31.2
18–44 years	34.4	38.6	30.2
18–24 years	28.0	29.7	26.4
25–34 years	35.3	38.7	32.0
35–44 years	38.4	45.5	31.1
45–64 years	39.8	46.2	32.7
45–54 years	40.1	46.7	33.0
55–64 years	39.5	45.7	32.4
65 years and over	38.2	42.4	32.2
65–74 years	40.1	45.1	33.7
75–84 years	35.4	39.6	28.8
85 years and over	33.7	34.0	*33.0
All children 2–6 years	43.3	42.2	44.4
2 years	43.8	42.6	44.9
3–4 years	46.6	45.4	47.7
5–6 years	40.0	39.2	40.9

NOTE: See table 9 for population.

Table 2. Unadjusted and age-adjusted percent of persons using vitamin and mineral products, by age and selected characteristics: United States, 1986

Characteristic	All adults 18 years of age and over				All children 2–6 years of age	All adults 18 years of age and over
	Total	18–44 years	45–64 years	65 years and over		
	Unadjusted percent					Age-adjusted percent[1]
Sex						
Female	41.3	38.6	46.2	42.4	42.2	40.9
Male	31.2	30.2	32.7	32.2	44.4	31.1
Race						
White	38.5	36.2	42.2	40.1	46.3	38.2
Black	21.5	22.7	22.2	14.2	30.3	21.2
Other	32.0	31.1	26.3	52.3	30.7	32.1
Race and sex						
White:						
Female	43.7	40.5	49.4	44.6	45.4	43.2
Male	32.9	32.1	34.3	33.8	47.1	32.8
Black:						
Female	23.8	25.9	22.1	17.3	30.5	23.5
Male	18.7	18.9	22.4	*9.7	30.0	18.4
Hispanic origin						
All non-Hispanic	36.9	35.0	40.2	38.1	44.1	36.6
All Hispanic	28.7	26.7	31.5	40.6	37.6	30.4
Mexican American	23.5	22.8	24.8	*29.5	36.9	24.6
Puerto Rican	28.0	*16.0	*52.8	*30.9	*22.6	28.9
Cuban	21.9	*15.3	*22.6	*48.7	*26.6	20.7
Other Hispanic	40.0	38.7	37.1	*58.9	45.2	40.6
Family income						
Less than $7,000	27.8	26.6	27.8	30.2	22.8	26.9
$7,000–$14,999	32.5	30.6	30.4	37.0	38.6	31.9
$15,000–$24,999	34.8	32.2	35.1	43.1	44.2	34.5
$25,000–$39,999	38.8	36.6	43.2	42.6	51.2	38.9
$40,000 or more	44.8	41.7	50.6	44.3	50.3	43.7
NHIS Poverty Index						
Below poverty line	24.2	23.8	24.2	25.7	27.3	24.0
Above poverty line	38.7	36.9	41.8	40.3	48.2	38.4
Education[2]						
Less than 12 years	25.5	20.3	26.3	30.7	26.9	23.7
12 years	36.0	31.2	42.1	45.3	40.1	36.3
13 years or more	44.5	42.6	49.3	47.3	51.0	44.8
Marital status						
Never married	34.3	34.2	33.6	37.4	. . .	36.8
Married	36.1	33.7	39.4	37.8	. . .	34.3
Widowed, separated, or divorced	40.1	38.6	43.2	39.0	. . .	39.0
Geographic region						
Northeast	35.5	33.5	39.6	35.0	39.2	35.1
Midwest	36.8	34.2	41.8	38.0	46.6	36.6
South	31.9	30.9	33.5	33.3	40.9	31.8
West	44.9	41.6	48.3	51.7	47.2	44.7
Place of residence						
All MSA's	37.9	36.0	41.3	39.6	44.7	37.7
Central city	36.3	35.1	38.6	36.6	40.1	36.3
Outside central city	39.1	36.5	43.1	42.2	47.7	38.7
Not MSA	31.4	28.6	34.7	34.6	38.7	31.0
Respondent-assessed health status						
Excellent or very good	38.2	36.0	44.1	39.7	45.1	38.6
Good	34.3	29.3	38.4	39.7	36.2	33.0
Fair or poor	31.3	31.1	29.1	33.8	44.2	30.4
Weight status						
Not overweight	38.6	36.3	42.5	41.8	– – –	38.8
Overweight	29.9	27.1	34.4	28.5	– – –	27.6

[1] Age-adjusted by the direct method to the age distribution of the 1980 total adult civilian noninstitutionalized population of the United States (aged 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and 85 years and over).

[2] Education of individual is shown for persons 18 years of age and over, and education of responsible adult is shown for children 2–6 years of age.

NOTE: See table 10 for population.

Table 3. Percent of persons, by sex, age, and type of product used, vitamins, and minerals: United States, 1986

Type of product, vitamins, and minerals	Both sexes					Female				Male			
	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	Children 2–6 years	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over
Type of product						Percent							
Single vitamin	15.0	12.9	17.7	18.2	5.6	16.7	13.9	20.3	19.9	13.2	11.9	14.8	15.8
Vitamin and mineral combination	13.3	12.0	15.0	14.9	4.9	16.8	15.2	19.5	17.6	9.5	8.9	10.1	11.0
All multivitamins	13.8	14.4	13.6	12.1	32.4	14.8	15.7	14.1	12.9	12.9	13.2	13.1	11.0
Multivitamin, multimineral	8.7	9.2	8.1	7.7	5.7	9.2	10.0	8.3	8.3	8.1	8.5	7.9	7.0
Multivitamin plus iron	1.6	1.6	1.8	1.4	7.9	2.2	2.5	2.0	1.6	1.0	0.6	1.6	*1.1
Multivitamin	3.6	3.7	3.7	2.9	18.8	3.4	3.2	3.9	3.0	3.8	4.1	3.5	2.9
Other vitamin combination	4.3	4.1	4.9	4.1	1.2	5.1	4.7	6.2	5.0	3.4	3.5	3.5	2.7
Single mineral	6.9	4.5	10.4	9.9	2.4	10.1	6.9	15.1	12.3	3.6	2.2	5.2	6.4
Other mineral combination	1.2	0.7	1.7	1.8	–	1.6	1.2	2.2	2.2	0.7	*0.3	1.2	*1.1
Multimineral	*0.1	*0.1	–	–	–	*0.1	*0.1	*0.1	–	–	–	–	–
Broad-spectrum	23.6	23.8	23.7	22.4	37.6	26.2	27.1	26.1	24.0	20.7	20.6	21.1	20.1
Specialized	22.0	18.5	27.5	25.8	8.2	26.9	22.0	34.9	29.8	16.9	15.1	19.4	20.1
Vitamins													
Vitamin C	30.8	30.2	32.2	30.8	40.7	33.6	32.7	35.7	33.3	27.8	27.7	28.4	27.2
Thiamin	26.5	26.5	27.2	25.1	38.0	29.5	29.9	30.4	27.2	23.2	23.2	23.7	22.1
Riboflavin	26.4	26.6	27.0	24.7	38.0	29.5	30.0	30.3	26.7	23.0	23.1	23.3	21.9
Vitamin B_6	26.5	26.6	27.2	25.1	37.5	29.7	30.2	30.5	27.4	23.1	23.1	23.6	21.8
Vitamin B_{12}	26.2	26.3	26.7	24.8	37.8	29.3	29.8	29.9	26.9	22.8	22.9	23.3	21.8
Niacin	26.2	26.3	26.9	24.6	37.9	29.3	29.7	30.3	26.4	22.9	23.0	23.1	22.0
Vitamin E	26.1	25.4	27.5	26.2	36.9	28.9	28.5	30.3	27.9	23.1	22.4	24.4	23.9
Vitamin A	23.0	22.9	23.5	22.3	38.0	25.9	26.3	26.3	24.4	19.8	19.6	20.5	19.4
Vitamin D	23.9	23.2	25.2	24.3	38.2	27.6	26.7	29.5	27.5	19.9	19.7	20.5	19.6
Folic acid	23.4	24.2	23.1	20.8	37.0	26.0	27.3	25.8	22.2	20.6	21.2	20.2	18.9
Pantothenic acid	22.2	22.4	22.3	21.3	8.9	24.9	25.4	25.3	22.3	19.3	19.5	19.1	19.1
Biotin	17.3	18.0	16.7	15.4	7.5	18.6	19.7	18.5	15.6	15.8	16.4	14.7	15.1
Minerals													
Iron	19.7	20.1	19.3	18.9	17.7	23.1	24.5	22.0	20.7	16.0	15.8	16.3	16.4
Calcium	19.5	17.8	22.3	21.4	7.5	24.7	22.0	29.1	26.3	14.0	13.6	14.8	14.4
Zinc	15.9	15.6	16.2	16.6	8.7	17.2	17.0	17.2	17.9	14.5	14.3	15.1	14.6
Magnesium	15.4	15.2	15.3	16.2	7.9	17.1	16.9	17.1	17.8	13.5	13.5	13.3	13.9
Iodine	14.0	14.1	13.5	14.3	7.6	15.3	15.7	14.3	15.5	12.6	12.6	12.7	12.6
Copper	14.2	14.2	13.8	14.4	6.6	15.2	15.3	14.7	15.6	13.1	13.2	12.9	12.7
Manganese	11.3	11.1	11.2	12.2	4.5	12.4	12.3	12.4	12.7	10.1	9.9	9.8	11.4
Phosphorus	10.2	10.6	9.9	9.6	6.2	11.2	11.8	10.3	10.7	9.2	9.4	9.4	8.0
Potassium	10.4	10.2	10.2	11.6	1.5	11.5	11.2	11.6	12.5	9.3	9.3	8.6	10.2
Chromium	8.5	8.9	7.8	8.6	2.1	9.4	9.9	9.1	8.7	7.6	7.9	6.4	8.5
Selenium	9.2	9.4	8.7	9.6	*0.3	10.3	10.5	10.2	10.2	8.1	8.3	7.1	8.7
Fluoride	*0.1	–	*0.1	*0.3	2.5	*0.1	–	*0.1	*0.4	–	–	*0.1	–

Table 4. Percent of vitamin and mineral supplement users, by sex, age, and type of product used, vitamins, and minerals: United States, 1986

Type of product, vitamins, and minerals	Both sexes					Female				Male			
	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	Children 2–6 years	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over
Type of product	Percent												
Single vitamin	41.2	37.4	44.4	47.7	13.0	40.4	35.9	44.0	46.9	42.3	39.2	45.1	49.1
Vitamin and mineral combination	36.4	35.0	37.8	39.0	11.4	40.6	39.3	42.2	41.6	30.5	29.5	30.9	34.2
All multivitamins	38.0	42.0	34.2	31.7	74.8	35.7	40.7	30.6	30.4	41.3	43.7	39.9	34.1
Multivitamin or multimineral	23.8	26.8	20.4	20.3	13.1	22.3	25.8	17.9	19.6	26.1	28.0	24.3	21.7
Multivitamin plus iron	4.4	4.5	4.5	3.7	18.2	5.3	6.5	4.2	3.8	3.1	2.1	5.0	*3.4
Multivitamin	9.8	10.7	9.3	7.7	43.4	8.1	8.4	8.4	7.0	12.1	13.6	10.7	9.0
Other vitamin combination	11.8	11.9	12.3	10.7	2.7	12.5	12.2	13.4	11.8	10.8	11.5	10.7	8.5
Single mineral	19.1	13.2	26.1	25.9	5.5	24.4	18.0	32.7	29.0	11.4	7.3	15.9	20.0
Other mineral combination	3.2	2.1	4.3	4.6	*0.1	3.9	3.0	4.7	5.2	2.1	*1.0	3.8	*3.5
Multimineral	*0.1	*0.2	*0.1	–	–	*0.2	*0.4	*0.1	–	–	*0.1	–	–
Broad-spectrum	64.7	69.3	59.6	58.7	86.8	63.5	70.2	56.4	56.7	66.4	68.3	64.6	62.4
Specialized	60.6	53.8	69.1	67.6	16.8	65.0	57.0	75.5	70.4	54.2	49.9	59.2	62.4
Vitamins													
Vitamin C	84.7	87.9	81.0	80.5	94.0	81.4	84.8	77.3	78.5	89.4	91.8	86.9	84.3
Thiamin	72.7	77.1	68.4	65.7	87.6	71.5	77.5	65.9	64.1	74.3	76.6	72.3	68.6
Riboflavin	72.4	77.3	67.8	64.7	87.7	71.4	77.8	65.5	63.0	73.9	76.6	71.3	67.9
Vitamin B_6	72.8	77.4	68.5	65.7	86.4	72.0	78.1	66.0	64.6	74.0	76.4	72.2	67.7
Vitamin B_{12}	71.8	76.5	67.2	64.9	87.1	70.9	77.2	64.7	63.4	73.2	75.6	71.1	67.6
Niacin	71.9	76.5	67.5	64.4	87.5	70.8	77.0	65.5	62.3	73.4	76.0	70.6	68.4
Vitamin E	71.7	73.9	69.1	68.7	85.2	69.8	73.9	65.5	65.8	74.2	74.0	74.7	74.3
Vitamin A	63.1	66.6	59.2	58.5	87.7	62.8	68.1	57.0	57.6	63.6	64.8	62.7	60.2
Vitamin D	65.6	67.4	63.3	63.5	88.1	66.8	69.2	63.8	64.9	63.8	65.1	62.6	61.0
Folic acid	64.2	70.5	58.1	54.5	85.4	62.9	70.8	55.8	52.4	66.2	70.1	61.8	58.6
Pantothenic acid	61.1	65.3	56.2	55.8	20.6	60.4	65.9	54.8	54.0	62.1	64.5	58.3	59.2
Biotin	47.4	52.4	42.0	40.3	17.3	45.1	51.0	40.0	36.8	50.7	54.2	45.1	46.9
Minerals													
Iron	54.1	58.5	48.5	49.5	40.8	56.0	63.5	47.6	48.8	51.5	52.3	49.9	51.0
Calcium	53.7	51.7	56.1	56.0	17.2	59.8	57.1	63.0	62.0	45.0	45.0	45.2	44.7
Zinc	43.7	45.5	40.6	43.4	20.1	41.7	44.2	37.2	42.3	46.6	47.1	46.0	45.3
Magnesium	42.2	44.1	38.4	42.3	18.3	41.4	43.8	36.9	41.9	43.3	44.6	40.8	43.2
Iodine	38.4	41.1	34.1	37.4	17.6	37.0	40.6	30.9	36.6	40.5	41.7	38.9	39.0
Copper	38.9	41.5	34.7	37.7	15.2	36.8	39.7	31.7	36.7	41.9	43.7	39.3	39.5
Manganese	31.0	32.4	28.0	31.9	10.3	30.1	31.9	26.9	30.1	32.4	32.9	29.8	35.4
Phosphorus	28.1	30.8	24.8	25.1	14.2	27.1	30.6	22.3	25.3	29.5	31.0	28.7	24.8
Potassium	28.7	29.8	25.6	30.3	3.5	27.9	29.0	25.1	29.6	29.7	30.9	26.3	31.7
Chromium	23.5	25.8	19.6	22.6	4.9	22.8	25.5	19.6	20.6	24.3	26.1	19.5	26.3
Selenium	25.4	27.3	21.9	25.1	*0.6	25.0	27.1	22.1	24.2	25.9	27.6	21.6	26.9
Fluoride	*0.2	*0.1	*0.2	*0.7	5.7	*0.2	–	*0.2	*1.0	*0.1	*0.2	*0.2	–

Table 5. Percent distribution and percents of persons using vitamin and mineral products by number taken and type of product, according to sex and age: United States, 1986

Number taken and type of product	Both sexes					Female				Male			
	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	Children 2–6 years	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over
	Percent distribution												
Total products taken[1]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 product	59.6	63.6	54.5	55.6	65.9	55.1	59.1	49.6	52.7	66.1	69.2	62.1	61.1
2 products	20.8	19.7	22.0	22.0	11.9	22.3	22.2	22.2	22.9	18.5	16.7	21.6	20.4
3–4 products	14.5	12.4	18.0	15.5	*2.2	17.0	13.9	22.7	16.3	11.1	10.6	10.6	13.9
5 products or more	5.1	4.2	5.5	6.9	–	5.6	4.9	5.4	8.1	4.2	3.4	5.7	*4.7
1 product taken[2]													
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Single vitamin	16.2	15.3	16.3	19.2	6.7	12.1	11.3	11.4	15.8	20.9	19.6	22.2	24.3
Vitamin and mineral combination	30.4	30.5	29.1	32.3	9.6	33.5	34.0	31.6	34.8	26.9	26.9	26.1	28.4
All multivitamins	40.8	44.0	37.3	34.8	80.3	39.1	43.6	33.9	33.2	42.7	44.4	41.6	37.1
Multivitamin, multimineral	25.2	27.7	21.2	22.7	12.9	23.6	27.6	16.5	21.9	27.1	27.8	26.9	24.0
Multivitamin plus iron	4.4	4.4	5.0	3.7	20.4	5.8	6.2	6.1	*4.1	2.8	2.4	*3.6	*3.0
Multivitamin	11.1	11.9	11.1	8.3	47.0	9.7	9.7	11.2	7.2	12.8	14.2	11.0	10.1
Other vitamin combination	6.3	6.7	5.8	5.8	*2.8	5.4	5.6	5.0	*5.4	7.4	7.8	6.7	*6.6
Single mineral	6.0	3.3	11.1	7.6	*0.7	9.6	5.4	17.6	10.6	1.9	*1.1	*3.2	*2.9
Other mineral combination	*0.3	*0.2	*0.4	*0.4	–	*0.3	*0.3	*0.6	*0.2	*0.3	*0.2	*0.2	*0.7
Multimineral	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Broad-spectrum	67.7	72.2	61.3	62.1	92.0	67.1	74.0	57.4	60.3	68.5	70.2	66.0	65.0
Specialized	32.3	27.8	38.7	37.9	8.0	32.9	26.0	42.6	39.8	31.5	29.8	33.9	35.0
2 products taken[2]						Percent							
Single vitamin	56.5	57.3	55.1	56.9	51.3	49.9	48.1	49.3	55.7	67.9	72.7	64.4	59.2
Vitamin and mineral combination	39.4	38.0	41.3	40.1	*17.9	44.0	44.0	45.3	41.8	31.6	26.0	34.9	36.7
All multivitamins	38.1	44.8	31.8	29.7	79.7	35.3	40.1	29.8	31.1	43.0	52.7	35.1	26.9
Multivitamin, multimineral	22.8	28.0	18.8	14.9	21.5	21.9	25.0	20.2	16.6	24.3	32.9	16.6	*11.5
Multivitamin plus iron	5.3	6.6	*3.9	*4.0	*15.1	6.0	9.0	*1.9	*4.5	4.0	*2.5	*7.1	*2.8
Multivitamin	10.0	10.2	9.1	10.8	43.1	7.3	6.0	*7.7	*10.0	14.6	17.2	*11.3	*12.4
Other vitamin combination	13.3	12.3	16.2	11.1	*2.5	14.1	14.0	16.9	*11.5	11.4	9.6	15.0	*10.4
Single mineral	24.6	20.0	28.1	31.9	33.4	28.0	26.0	30.4	29.7	18.8	10.1	24.3	36.6
Other mineral combination	4.3	4.1	*4.1	*5.1	*0.8	5.3	4.8	*4.7	*7.6	*2.6	*3.0	*3.2	–
Multimineral	–	–	–	–	–	–	–	–	–	–	–	–	–
	Percent distribution												
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Only broad-spectrum	8.6	11.7	5.1	*5.6	*15.7	7.2	9.7	*3.7	*6.0	11.0	15.0	*7.4	*4.9
Only specialized	35.5	28.7	40.5	46.4	*6.7	36.9	29.6	42.4	47.3	33.2	27.2	37.4	44.5
Combination	55.9	59.6	54.3	48.0	77.7	55.9	60.7	53.9	46.7	55.8	57.9	55.1	50.6
3 or more products taken[2]						Percent							
Single vitamin	86.1	86.8	84.1	87.9	*70.9	83.8	84.9	81.5	85.5	91.0	89.9	91.3	93.8
Vitamin and mineral combination	52.3	49.7	55.1	53.6	*57.7	54.7	51.6	57.6	56.1	47.2	46.4	48.3	47.8
All multivitamins	38.1	43.1	35.6	30.3	*49.7	34.9	42.1	30.2	28.3	44.7	44.9	50.2	35.2
Multivitamin, multimineral	25.9	29.1	23.5	22.2	*13.7	23.4	27.0	20.9	20.3	31.1	32.7	30.7	*27.1
Multivitamin plus iron	4.2	4.0	4.8	*3.8	*4.0	4.4	5.7	*3.6	*3.1	*3.9	*1.0	*8.2	*5.6
Multivitamin	7.9	10.0	7.2	*4.2	*31.4	7.1	9.3	*5.7	*4.9	9.7	11.2	*11.3	*2.5
Other vitamin combination	27.8	32.8	23.5	23.2	*8.6	28.2	32.2	24.2	27.2	26.8	34.0	21.8	*13.3
Single mineral	49.1	40.5	55.7	57.7	*44.0	53.4	46.5	58.6	58.6	40.0	30.5	48.0	55.6
Other mineral combination	10.7	7.2	13.3	14.6	–	11.2	9.8	11.4	13.9	9.8	*2.8	18.6	*16.7
Multimineral	*0.7	*1.3	*0.4	–	–	*1.0	*1.9	*0.5	–	*0.2	*0.4	–	–

	Percent distribution												
Total	100.0	100.0	100.0	100.0	*100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Only broad-spectrum	*0.7	*0.8	*0.9	–	*4.0	*0.9	*1.0	*1.3	–	*0.3	*0.5	–	–
Only specialized	33.8	30.3	35.7	38.8	*9.1	36.1	31.3	38.7	41.3	29.0	28.4	27.6	32.7
Combination	65.5	68.9	63.4	61.2	*86.9	63.0	67.7	60.0	58.7	70.8	71.0	72.4	67.2

[1]Excludes vitamin and mineral supplement users with unknown number of products taken.
[2]Excludes products of unknown type.

Table 6. Number of vitamin and mineral products used by adults and children and percent distribution by frequency of use, according to type of product: United States, 1986

Type of product	*Vitamin and mineral products used by adults 18 years of age and over*					*Vitamin and mineral products used by children 2–6 years of age*				
		Frequency of use					*Frequency of use*			
	All products	*Total*[1]	*Daily*	*2–6 days a week*	*Weekly*	*All products*	*Total*[1]	*Daily*	*2–6 days a week*	*Weekly*
	Number in thousands	Percent distribution				Number in thousands	Percent distribution			
All vitamin and mineral products[2]	111,433	100.0	70.8	24.0	5.2	9,186	100.0	71.2	26.0	*2.8
Single vitamin	32,620	100.0	71.3	22.2	6.5	1,054	100.0	65.1	*30.2	*4.7
Vitamin and mineral combination	24,100	100.0	71.0	24.0	5.0	948	100.0	64.6	*33.1	*2.3
All multivitamins	23,506	100.0	70.6	26.1	3.4	5,917	100.0	75.6	22.1	*2.4
Multivitamin, multimineral	14,746	100.0	70.4	26.7	*2.8	1,043	100.0	65.1	*31.2	*3.7
Multivitamin plus iron	2,710	100.0	71.3	24.4	*4.4	1,432	100.0	81.2	*17.7	*1.1
Multivitamin	6,050	100.0	70.5	25.3	*4.2	3,441	100.0	76.4	21.1	*2.5
Other vitamin combination	7,383	100.0	71.8	23.4	*4.8	*213	*100.0	*67.8	*24.9	*7.3
Single mineral	13,224	100.0	70.1	24.5	5.4	431	100.0	*66.8	*33.2	–
Other mineral combination	1,959	100.0	75.1	*20.0	*5.0	*7	*100.0	*100.0	–	–
Multimineral	*90	*100.0	*65.6	*34.4	–	–	–	–	–	–
Broad-spectrum	40,936	100.0	70.6	25.3	4.1	6,887	100.0	74.5	23.2	*2.3
Specialized	61,946	100.0	71.3	22.9	5.8	1,682	100.0	64.1	31.7	*4.2

[1]Excludes vitamin and mineral products with unknown frequency of use.
[2]Includes vitamin and mineral products of unknown type.

Table 7. Percent of Recommended Dietary Allowances for adults 18 years of age and over, by selected percentiles, age, sex, vitamins, and minerals: United States, 1986

Sex, vitamins, and minerals	Percentile											
	All adults 18 years of age and over			18–44 years			45–64 years			65 years and over		
	Median	90th	95th	Median	90th	95th	Median	90th	95th	Median	90th	95th
	Percent											
Males												
Vitamins:												
Vitamin A	150	300	---	150	300	751	150	300	---	150	300	---
Vitamin D	200	251	400	200	250	400	200	250	400	200	262	325
Vitamin E	200	2,666	2,860	200	1,106	2,756	200	2,667	2,867	200	2,667	2,866
Vitamin C	250	1,667	2,084	238	1,667	2,143	333	1,667	2,166	200	1,666	2,000
Folic acid	100	100	175	100	100	200	100	100	175	100	100	100
Thiamin	191	2,500	4,286	161	2,500	4,081	238	3,125	4,761	250	2,361	6,250
Riboflavin	186	1,875	3,571	163	2,187	3,572	213	2,187	3,571	243	1,071	2,214
Niacin	125	625	632	111	556	556	159	625	833	188	625	625
Vitamin B_6	136	1,786	3,409	136	1,948	3,409	136	1,894	3,409	136	909	3,409
Vitamin B_{12}	300	1,800	3,332	300	1,667	3,332	300	2,500	3,334	300	833	5,000
Biotin[1]	26	96	200	30	100	200	23	66	106	20	62	200
Pantothenic acid[1]	182	909	1,364	182	909	1,364	182	909	1,364	182	520	909
Minerals:												
Calcium	20	78	116	20	70	100	20	83	125	20	95	138
Phosphorus	15	33	56	15	33	56	16	31	56	15	25	33
Iodine	100	100	157	100	107	200	100	100	150	100	100	100
Iron	180	301	540	180	360	540	180	288	400	212	299	500
Magnesium	29	57	100	29	57	86	29	51	97	29	57	101
Copper[1]	80	120	120	80	120	160	80	120	120	80	120	120
Zinc	100	200	333	100	200	309	100	200	333	100	167	300
Females												
Vitamins:												
Vitamin A	188	375	---	188	375	563	188	375	375	188	375	---
Vitamin D	200	262	343	200	225	325	200	263	357	200	300	400
Vitamin E	250	3,333	3,583	250	2,150	3,458	250	3,571	4,166	250	3,450	5,033
Vitamin C	200	1,666	1,917	167	1,660	1,927	200	1,667	1,833	275	1,664	1,867
Folic acid	100	100	200	100	100	200	100	100	200	100	100	113
Thiamin	225	3,000	6,000	225	3,000	7,500	225	3,000	5,300	249	2,499	5,000
Riboflavin	217	2,083	4,167	217	2,136	5,140	217	2,083	4,166	217	1,417	2,917
Niacin	154	769	846	154	769	846	154	769	1,000	154	769	769
Vitamin B_6	150	2,381	3,750	150	2,500	5,000	150	1,786	3,750	150	1,250	2,500
Vitamin B_{12}	250	1,667	3,332	229	1,800	3,333	200	1,667	3,332	300	1,666	3,332
Biotin[1]	30	150	200	30	143	200	30	200	200	30	100	200
Pantothenic acid[1]	182	909	1,429	182	909	1,584	182	818	1,429	182	546	1,169
Minerals:												
Calcium	31	113	150	20	94	125	38	125	156	31	125	150
Phosphorus	16	33	56	16	33	56	16	44	63	16	21	38
Iodine	100	100	143	100	100	143	100	100	150	100	100	114
Iron	150	278	450	100	247	345	160	360	500	270	299	476
Magnesium	33	80	133	33	76	125	33	100	133	33	63	133
Copper[1]	80	120	120	80	120	120	80	120	120	80	120	120
Zinc	100	159	200	100	159	200	100	190	200	100	159	226

[1]Pantothenic acid, copper, and biotin are reported as percents of the midrange ESADDI level, as established by the Food and Nutrition Board, owing to lack of RDA's for those nutrients.

NOTES: Includes vitamins and minerals with established RDA (or ESADDI) values.
The median, 90th, and 95th percentiles are calculated for users of specific nutrients only.
Excluded are persons who took any prescription vitamin or mineral product or whose average daily intake for a specific nutrient was unknown.

Table 8. Percent of Recommended Dietary Allowances for children 2–6 years of age, by selected percentiles, vitamins, and minerals: United States, 1986

Vitamins and minerals	Percentile		
	Median	90th	95th
	Percent		
Vitamins			
Vitamin A	---	---	375
Vitamin D	100	100	100
Vitamin E	167	333	400
Vitamin C	133	556	769
Folic acid	150	300	400
Thiamin	117	214	250
Riboflavin	119	213	238
Niacin	122	182	222
Vitamin B_6	82	167	222
Vitamin B_{12}	180	257	300
Biotin[1]	53	124	177
Pantothenic acid[1]	286	333	429
Minerals			
Calcium	11	20	38
Phosphorus	6	16	25
Iodine	153	214	214
Iron	120	180	191
Magnesium	13	40	67
Copper[1]	118	167	167
Zinc	80	150	150

[1]Pantothenic acid, copper, and biotin are reported as percents of the midrange ESADDI level, as established by the Food and Nutrition Board, owing to lack of RDA's for those nutrients.

NOTES: Includes vitamins and minerals with established RDA (or ESADDI) values.
The median, 90th, and 95th percentiles are calculated for users of specific nutrients only.
Excluded are persons who took any prescription vitamin or mineral product or whose average daily intake for a specific nutrient was unknown.

Table 9. All persons and persons using vitamin and mineral products, by sex and age: United States, 1986

Age	All persons			Persons using vitamin and mineral products[1]		
	Both sexes	Female	Male	Both sexes	Female	Male
	Number in thousands					
All adults 18 years and over	169,587	87,783	81,804	61,749	36,263	25,486
18–44 years	97,541	48,316	49,225	33,525	18,643	14,882
18–24 years	26,098	12,992	13,105	7,316	3,862	3,454
25–34 years	39,486	19,070	20,416	13,924	7,381	6,542
35–44 years	31,957	16,253	15,704	12,286	7,400	4,886
45–64 years	44,660	23,371	21,289	17,763	10,798	6,965
45–54 years	22,587	11,661	10,927	9,054	5,446	3,608
55–64 years	22,073	11,710	10,363	8,710	5,352	3,357
65 years and over	27,386	16,096	11,290	10,461	6,821	3,639
65–74 years	16,906	9,458	7,449	6,779	4,268	2,512
75–84 years	8,652	5,343	3,309	3,065	2,114	952
85 years and over	1,828	1,296	533	616	440	*176
All children 2–6 years	18,162	8,910	9,252	7,873	3,761	4,112
2 years	3,578	1,762	1,816	1,566	751	815
3–4 years	7,177	3,371	3,806	3,346	1,532	1,814
5–6 years	7,407	3,777	3,630	2,961	1,479	1,483

[1]Excludes persons who used only prescription vitamin and mineral products.

NOTE: Population figures exclude pregnant and lactating women 18–44 years of age.

Table 10. All persons and persons using vitamin and mineral products, by age and selected characteristics: United States, 1986

Characteristic	All persons					Persons using vitamin and mineral products[1]				
	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	Children 2–6 years of age	All adults 18 years of age and over	18–44 years	45–64 years	65 years and over	Children 2–6 years of age
	Number in thousands									
Race										
White	145,842	82,172	39,064	24,607	14,805	56,096	29,744	16,474	9,878	6,854
Black	18,583	11,821	4,477	2,286	2,711	3,999	2,679	995	325	821
Other	5,162	3,549	1,120	493	646	1,654	1,102	294	258	198
Race and sex										
White:										
Female	75,034	40,207	20,357	14,471	7,174	32,800	16,293	10,054	6,453	3,260
Male	70,808	41,965	18,707	10,136	7,630	23,296	13,451	6,419	3,425	3,594
Black:										
Female	10,211	6,367	2,478	1,366	1,384	2,432	1,648	547	236	422
Male	8,372	5,454	1,998	920	1,327	1,568	1,031	448	*89	398
Hispanic origin										
All non-Hispanic	159,092	90,085	42,379	26,628	16,148	58,732	31,534	17,045	10,153	7,116
All Hispanic	10,495	7,456	2,282	758	2,014	3,017	1,991	718	308	758
Mexican American	5,309	3,969	1,029	312	1,207	1,250	904	255	*92	445
Puerto Rican	1,140	729	343	*68	*162	319	*117	*181	*21	*37
Cuban	927	516	292	*119	*64	203	*79	*66	*58	*17
Other Hispanic	2,733	2,026	501	207	436	1,094	785	186	*122	197
Family income										
Less than $7,000	14,889	8,135	2,676	4,077	1,928	4,137	2,161	744	1,232	439
$7,000–$14,999	24,752	12,257	5,176	7,318	2,674	8,034	3,748	1,575	2,711	1,031
$15,000–$24,999	33,138	19,272	8,250	5,615	3,691	11,524	6,207	2,899	2,419	1,631
$25,000–$39,999	41,161	26,819	10,874	3,467	4,847	15,985	9,810	4,699	1,476	2,482
$40,000 or more	33,806	20,737	11,151	1,918	3,200	15,136	8,650	5,637	849	1,609
NHIS Poverty index										
Below poverty line	17,481	11,534	3,209	2,738	3,362	4,227	2,747	776	704	919
Above poverty line	138,291	79,975	37,602	20,714	13,464	53,584	29,496	15,731	8,358	6,487
Education[2]										
Less than 12 years	41,599	15,785	12,356	13,459	2,680	10,596	3,212	3,247	4,137	721
12 years	64,954	38,599	18,388	7,967	6,572	23,407	12,056	7,740	3,611	2,633
13 years or more	62,013	42,764	13,690	5,558	8,865	27,611	18,231	6,752	2,628	4,519
Marital status										
Never married	32,386	29,227	1,628	1,531	...	11,104	9,983	547	573	...
Married	109,299	59,034	35,088	15,176	...	39,446	19,889	13,819	5,738	...
Widowed, separated, or divorced	27,477	9,019	7,825	10,633	...	11,015	3,485	3,381	4,149	...
Geographic region										
Northeast	36,660	19,633	10,297	6,731	3,226	13,004	6,574	4,077	2,353	1,266
Midwest	40,905	23,837	10,473	6,596	4,492	15,033	8,146	4,379	2,508	2,093
South	58,612	34,428	15,104	9,080	6,624	18,719	10,627	5,065	3,027	2,712
West	33,410	19,644	8,787	4,979	3,820	14,993	8,178	4,242	2,573	1,802
Place of residence										
All MSA's	130,787	76,610	34,319	19,859	14,061	49,581	27,550	14,175	7,856	6,284
Central city	54,515	31,379	13,772	9,364	5,538	19,770	11,024	5,317	3,429	2,222
Outside central city	76,272	45,231	20,546	10,495	8,522	29,811	16,526	8,858	4,427	4,062
Not MSA	38,800	20,931	10,341	7,528	4,101	12,168	5,976	3,588	2,605	1,589

Respondent-assessed health status										
Excellent or very good	105,681	71,405	23,966	10,310	14,305	40,402	25,741	10,573	4,088	6,447
Good	42,039	20,234	12,438	9,367	3,225	14,436	5,937	4,778	3,721	1,168
Fair or poor	21,281	5,610	8,165	7,506	484	6,658	1,742	2,379	2,538	214
Weight status										
Not overweight	128,136	77,491	30,449	20,195	---	49,512	28,116	12,952	8,443	---
Overweight	38,550	18,749	13,414	6,387	---	11,512	5,080	4,615	1,818	---

[1] Excludes persons who used only prescription vitamin and mineral products.
[2] Education of individual is shown for persons 18 years of age and over, and education of responsible adult is shown for children 2–6 years of age.

NOTE: Population figures exclude pregnant and lactating women 18–44 years of age.

References

1. Vitamin, mineral and dietary supplements. Position paper on food and nutrition misinformation on selected topics. J Am Diet Assoc 66:277. 1975.
2. Council on Scientific Affairs. Vitamin preparations as dietary supplements and as therapeutic agents. JAMA 257:1929–36. 1987.
3. Statement on vitamin and mineral supplements. The Joint Public Information Committee of the American Institute of Nutrition and the American Society for Clinical Nutrition. Callaway CW (Chair), McNutt KW, Rivlin RS, Ross AC, Sandstead HH, Simopoulos AP. J Nutr 117(10):1649. 1987.
4. Block G, Cox C, Madans J, Schreiber GB, Licitra L, Melia N. Vitamin supplement use by demographic characteristics. Am J Epidemiol 127:297–309. 1988.
5. Stewart ML, McDonald JT, Levy AS, Schucker RE, Henderson DP. Vitamin mineral supplement use: a telephone survey of adults in theUnited States. J Am Diet Assoc 85:1585–90. 1985.
6. U.S. Department of Health and Human Services. Promoting health/preventing disease: objectives for the nation. Washington: U.S. Government Printing Office. 1980
7. Food and Nutrition Board. Recommended Dietary Allowances, 9th rev. ed., 1980. Washington: National Academy of Sciences. 1980.
8. Dawson DA, Adams PF. Current estimates from the National Health Interview Survey, United States, 1986. National Center for Health Statistics. Vital Health Stat 10(164). 1987.
9. Levy AS, Schucker RE. Patterns of nutrient intake among dietary supplement users: attitudinal and behavioral correlates. J Am Diet Assoc 87(6):754–60. 1987.
10. U.S. Department of Health and Human Services. The Surgeon General's report on nutrition and health: summary and recommendations. Washington: Public Health Service. 1988.
11. Recommendations concerning supplement usage: ADA statement. J Am Diet Assoc 87(10):1342–43. 1987.
12. Committee on Diet and Health, Food and Nutrition Board: Commission on Life Sciences. Diet and health: implications for reducing chronic disease risk. Washington: National Academy Press. 1989.
13. Health implications of obesity: National Institutes of Health consensus development conference statement. Ann Intern Med 103 (6 Pt 2):1073–77. 1985.
14. Kovar MG, Poe GS. The National Health Interview Survey design. 1983–84, and procedures, 1975–83. National Center for Health Statistics. Vital Health Stat 1(18). 1985.
15. Moss AJ, Parsons VL. Current estimates from the National Health Interview Survey, United States, 1985. National Center for Health Statistics. Vital Health Stat 10(160). 1986.

Symbols

- - -	Data not available
. . .	Category not applicable
–	Quantity zero
0.0	Quantity more than zero but less than 0.05
*	Figure does not meet standards of reliability or precision

Technical notes

Source and description of data

This report contains data from the 1986 National Health Interview Survey (NHIS). The NHIS is a continuing cross-sectional nationwide survey of the civilian noninstitutionalized population. Each week a probability sample of households in the United States is interviewed by personnel of the U.S. Bureau of the Census. The interview obtains information on the health and other characteristics of each household member living at the time of interview.

During 1986, NHIS interviews were conducted in 23,838 households, resulting in a sample of 62,052 persons. Interviews were not obtained for an additional 860 eligible households primarily because of respondent refusal or failure to find an eligible respondent at home after repeated attempts, producing a noninterview rate of 3.5 percent of all total eligible households.

The questions on the use of vitamin and mineral products were only asked in the NHIS during the 6-month period from January into July, 1986. The sample consisted of one randomly selected adult 18 years of age or older and, if available, one randomly selected child 2 through 6 years of age, from each interviewed family. With few exceptions, adults responded to the vitamin and mineral questionnaire for themselves. However, any adult family member knowledgeable about the sample child was eligible to respond about the child's use of vitamin and mineral products. The proxy respondent for sample children was usually the mother of the child.

Information about the use of vitamin and mineral products was not obtained for 3.4 percent of this eligible subsample, primarily because of the self-response requirement among adult sample persons. The final interviewed vitamin and mineral sample contained 13,652 persons—11,775 adults and 1,877 children from 11,879 households. The overall response rate, combining response rates for the household questionnaire and vitamin and mineral questionnaire, was 93.1 percent.

The estimates in this report are actually based on responses for 13,435 sample persons. These data do not include 217 women of childbearing age who reported being pregnant or breastfeeding at the time of the interview. They are excluded from the analysis altogether since their use of vitamin and mineral products was not expected to reflect their usual vitamin and mineral use practices given the special nutrient requirements of pregnant and breastfeeding women. Individuals taking only prescription vitamin and mineral products are included in the analysis but are not classified as vitamin and mineral users.

Item nonresponse for the data discussed in this report ranged from 0.1 percent for whether vitamins and/or minerals were used in the past 2 weeks to 7.9 percent for manufacturer and brand name information used to derive the specific nutrient components of the vitamin and mineral products taken.

Verification of vitamin and mineral products

Several edit checks were performed during data processing for every reported vitamin and mineral product in order to improve the quality of the specific nutrient potency data collected in the 1986 NHIS. All nutrient potency values reported for each product were checked and corrected by comparison with such references as the 1986 edition of the *Physicians' Desk Reference* (PDR) for prescription and nonprescription drugs, company brochures, and independently obtained product labels; through direct contact with companies; and through comparison with nutrient concentration data of other records for the same product. Of the 8,700 individual products upon which the estimates in this report are based, about 84 percent had one or more of these independent accuracy checks made. For the remaining products, the reference information just described was not available, nor were other products of the same brand name or type reported. In many of these cases, however, the vitamin and mineral product nutrient data recorded by the interviewers were checked and corrected by inserting nutrient data from *similar* products. The nutrient values, as recorded on the questionnaire, were used only when a similar product was not identified.

Sampling errors

Because estimates shown in this report are based on a sample of the population rather than on the entire population, they are subject to sampling error. When an estimate or the numerator or denominator of a percent is small, the sampling error may be relatively high. In addition, the complex sample design of the NHIS has the effect of making the sampling errors larger than they would be had a simple random sample of equal size been used.

Approximate standard errors for the following estimated percents in tables 1, 2, and 3 of this report may be calculated by using the formula

$$SE(p) = p\sqrt{.0000825 + 16{,}700/x}$$

where p is the estimated percent and $x = pY/100$ with Y = the population denominator.

Table 1: all persons 18 years of age and over, and any combination of the age groups 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, and 75 years and over.

Table 2: the estimated percents by sex, race, sex and race, and for the age groups 18 and over: 18–44, 45–64, and 65 years of age and over.

Table 3: all estimated percents in this table.

Approximate standard errors for all other percents presented in tables 1 and 2 not previously mentioned and all estimated percents in tables 4 and 5 may be calculated by using the formula

$$SE(p) = \sqrt{\frac{16{,}700\ (p)\ (100 - p)}{y}}$$

where p is the estimated percent and y, the population denominator.

Approximate standard errors for all estimated percents in table 6 may be calculated by using the formula

$$SE(p) = \sqrt{\frac{(37{,}000)\,p\,(100-p)}{y}}$$

where p is the estimated percent and y is the population denominator, which in this case is the total number of products shown in column 1.

The estimated parameters for calculating the approximate standard errors for the percentile of RDA's and ESADDI's in tables 7 and 8 of this report are in the process of being generated.

The population numbers for the following age groups in table 9 have been adjusted to official U.S. Bureau of the Census figures and their standard errors are assumed to be 0.0: 18 years of age and over, 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, and 65 years and over.

Similarly, all population figures in table 10 by sex, race, sex and race, and for the age groups 18 years of age and over, 18–44, 45–64, and 65 years of age and over have no sampling error. The approximate SE's for all remaining estimated numbers (x) in tables 9 and 10 can be computed by the formula

$$SE(x) = \sqrt{(.0000825)\,(x)^2 + (16{,}700)(x)}$$

The approximate standard error of a difference between percents is given by the formula

$$SE\,(x_1 - x_2) = \sqrt{(SE\,(x_1)^2 + SE\,(x_2)^2}$$

where x_1 and x_2 are the two percents being compared, $x_1 - x_2$ is the difference between them, and $SE(x_1)$ and $SE(x_2)$ are the standard errors of the two percents. In this report, a difference was considered statistically significant at the 5-percent level if the difference $(x_1 - x_2)$ was at least twice as large as its standard error.

Age-adjusted rates

This report includes data that have been adjusted by the direct method to the age distribution of the selected standard population, in this case the 1980 civilian noninstitutionalized population of the United States. Age adjustment by the direct method is accomplished by multiplying the age-specific rate for each age group by the population for the corresponding age group in the standard population. The cross products of the multiplications are summed and divided by the total of the standard population to obtain the age-adjusted rate. Eight age groups were used for the age adjustment in this report: 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, 74–84, and 85 years and over.

Definition of terms

Nine product classifications—

Single vitamin: product contains only one vitamin.

Multivitamin: product contains no minerals and vitamins A, D, E, C, B_1, B_2, B_6, B_{12}, folic acid, and niacin.

Other vitamin combination: product contains no minera'ls, is not a multivitamin, and contains at least two vitamins.

Single mineral: product contains only one mineral.

Multimineral: product contains no vitamins and the following minerals: calcium, phosphorus, iodine, iron, and magnesium.

Other mineral combination: product contains no vitamins, is not a multimineral, and contains at least two minerals.

Multivitamin and multimineral: product contains vitamins A, D, E, C, folic acid, B_1, B_2, B_6, B_{12}, niacin, calcium, phosphorus, iodine, iron, and magnesium.

Multivitamin plus iron: product is a multivitamin as previously defined except that it includes iron.

Other vitamin mineral combination: product is not one of the types of vitamin and mineral products listed above but contains at least one vitamin and one mineral.

Weight status—The weight status classification shown in this report for adults is derived from the calculation of body mass index (BMI) using the formula of weight/height^2 where weight is in kilograms and height is in meters. It is an approximate measure of overweight given that body composition varies among persons of the same height and weight (13). Specifically, the BMI cutoff points used to identify overweight persons were determined by NCHS' National Health and Nutrition Examination Survey II (NHANES II) and are as follows: for males, BMI = 27.8 or greater and for females, BMI = 27.3 or greater.

Respondent-assessed health status—The categories related to respondent-assessed health status result from asking the respondent, "Would you say _____'s health is excellent, very good, good, fair, or poor?" As such, it is based on a respondent's opinion and not directly on any clinical evidence.

NHIS poverty index—Persons are classified as being above or below the poverty line by using the poverty index as originated at the Social Security Administration in 1964 and revised by Federal interagency committees in 1969 and 1980. The poverty index is based solely on money income and does not reflect the fact that many low-income persons receive noncash benefits such as food stamps, Medicaid, and public housing. The index is based on the Department of Agriculture's 1961 economy food plan and reflects the different consumption requirements of families according to their size and composition. The poverty thresholds are updated every year to reflect changes in the Consumer Price Index. Because NHIS data on family income are collected by income categories rather than by specific amounts of money, the NHIS estimates of persons living in poverty will vary slightly from the Current Population Survey estimates.

Race and ethnicity—Estimates for the white and black populations are based on respondents' reported racial identifications. The Hispanic classification is also based on the respondent's description.

More detailed discussions of the sample design, estimating procedures, procedures for estimating standard errors, nonsampling errors, and definitions of other sociodemographic terms used in this report have been published in Vital and Health Statistics, Series 10, Nos. 160 and 164, and in Series 1, No. 18 (8,14,15).

A public use data file based on the 1986 Vitamin Mineral Supplement questionnaire was released in December 1988. Information regarding the purchase of the public use tape can be obtained by writing the Division of Health Interview Statistics, National Center for Health Statistics, 3700 East-West Highway, Hyattsville, MD 20782.

NOTE: Publication of this report would not have been possible without the contributions of the following persons. Within The National Center for Health Statistics, Sue Hsiung was responsible for constructing and editing the vitamin mineral data tapes from which these data are derived. George Gerhold and Anthony Thomas developed the computer programs that generated the tables for this report. And Catherine Woteki willingly critiqued several versions of the manuscript. Beth Yetley, with the Food and Drug Administration, gave generously of her time throughout the planning and preparation of this report. To all of these persons, the authors express their thanks.

Recent Issues of ***Advance Data From Vital and Health Statistics***

No. 168. Health Characteristics of Workers by Occupation and Sex: United States, 1983–85 (Issued April 25, 1989)

No. 169. Hospital Inpatient Surgery: United States, 1983–87 (Issued May 23, 1987)

No. 170. Aging in the Eighties: The Prevalence of Comorbidity and its Association With Disability (Issued May 26, 1989)

No. 171. Office Visits to Cardiovascular Disease Specialists, 1985 (Issued June 23, 1989)

No. 172. Characteristics of Persons Dying of Heart Disease; Preliminary Data From the 1986 National Mortality Followback Survey (In preparation)

No. 173. Characteristics of Persons Dying From AIDS: Preliminary Data From the 1986 National Mortality Followback Survey (In preparation)

Suggested citation

Moss AJ, Levy AS, Kim I, Park YK. Use of vitamin and mineral supplements in the United States: current users, types of products, and nutrients. Advance data from vital and health statistics; no 174. Hyattsville, Maryland: National Center for Health Statistics. 1989.

Copyright information

This report may be reprinted without further permission.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics
3700 East-West Highway
Hyattsville, Maryland 20782

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

To receive this publication regularly, contact the National Center for Health Statistics by calling 301-436-8500

DHHS Publication No. (PHS) 89-1250

BULK RATE
POSTAGE & FEES PAID
PHS/NCHS
PERMIT No. G-281

•U.S. G.P.O. 1989-241-281:80034